ADDENDUM

Several new features are contained in the 12/20/82 release of your XOR CP/M.

1.) DIAGNOSE.COM is I an automatic,NON-DESTRUCTIVE system test utility that will test system memory and both drives. It should be run before drive "B:" has been accessed. The tests take about 5 minutes to run and assure everything is in good shape to run your software. Data is output to system printer so you need not and watch the screen. (Got to keep up with IBM you know!)

2.) BACKUP.COM will help first time users make that initial important backup of their CP/M source disks. BACKUP should be the FIRST program that you run after receiving your computer. The SOURCE disk goes in drive "A" and a BLANK destination disk in drive "B". BACKUP will format the destination disk and copy A to B. (In all XOR systems drive "A" is on the left and drive "B" is on the right.)

3.) HELP.COM will aid first users of CP/M, BASIC, and many other run time programs. Simply type HELP CPM <CR> or HELP MBASIC or whatever ???.HLP program libraries appear on your current distribution disks. To see what they might be, type D *.HLP <CR>.

4.) SURVEY.COM will look over all i.o. ports and report what is being used. Interesting to use when you want to add something else to the system and want to avoid clashes. (why not ?)

5.) MDISK is now with us. - WHAT IS MDISK you ask ?
It is a kind of cache memory system that is CP/M oriented. It takes the place of the "D" drive and is as large as your pocket book. For all intents and purposes it is a disk drive. Only it stores it's data in RAM. It can be expanded in 48K increments to about 500K. If you do a lot of assembler or compiler work and can think of several hundred better things to do than sit waiting for the processor to complete it's task, this may be useful to you.

Typical performance increases over our floppy times will be in excess of 100 per cent. (That means you will only have to sit half as long.) Those of you who are familiar with our system will realize that as we are already the fastest around, this is some real improvment. Comparing it to an Apple or an Orange is a joke.

MDISK will assemble a 20K assembly source program producing a 30K 20K MACRO LIB files in 21 seconds ! Our Apple took 3 1/2 minutes and our Plastic Shack 2 min and 14 secs to do similar tasks. Unfortunatly the Orange was in peels by the time we got to it so no testing could be done.

Loading a large .COM file like MBASIC (28k) takes .68 sec. Actually hard to measure. I'ts fun impressing your friends with it.

6.) Maybe this is not a feature but it does have to be mentioned. If your drives are made by TANDON, (a slimline with closing lever at the upper right) the disks are to be inserted with the label (top) to the RIGHT. This is different than the other models used in XOR systems in the past.

7.) The disk drivers for 48 and 96 tpi, single and double sided mini 5" drives have been turned on in the distribution version of the CP/M "A" and "B" disks. We strongly recommend (in fact insist?) that you use the 512 byte per sector mode for all the mini types. To run minis with 8" drives, simply plug in the drives and run DFOCO to format the minis. The command line to correctly format a 96 tpi double sided drive in DFOCO would be;

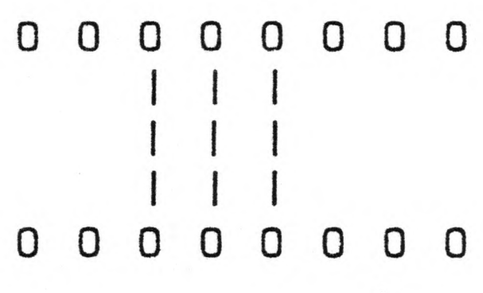
* DFORMAT C: SIZE 512 MINI96 DBL <CR>

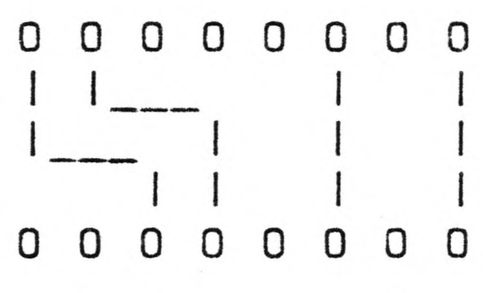
We are assuming drives "A" and "B" are 8" and drives "C" and "D" are strapped as minis.

After formatting and PIPing data to the mini, the operating system may be transferred to the mini useing DSYSGEN. See the manual for specifics on using DSYSGEN. Transfer method #3 where you answer <CR>, <CR> to the first two questions and then take the OS directly from the 8" floppy and put it on the mini would be the easiest to do. After successfully accomplishing the above two feats, re-strapping the floppy controller so that the minis are "A" and "B" will allow you to boot from them after a reset.

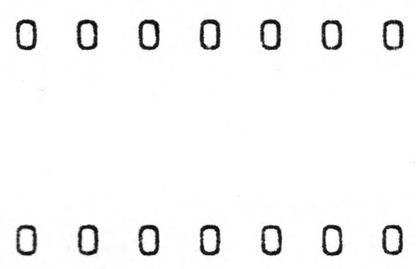
Some problems have been noticed booting mini floppies by certain manufacturers. It will work but sometime not always on the first try. It is caused by a drive ready signal not being available as is on 8" systems. A new version of the boot prom, (vers 1.85) is corrects this problem.

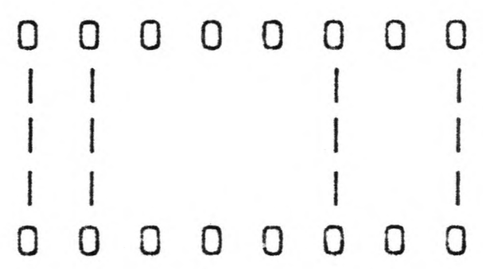
8 INCH JUMPER STRAPS AS SHIPPED FROM FACTORY A,B = 8" C,D = MINI





5 INCH AS A and B





8.) A parallel printer driver has been installed in the bios STDLST.ASM. This driver can be used for Centronics type cable interfaces. (See the appendix for parallel cable wiring.) Three methods may be used to "turn on" this driver. As shipped the bios drives the serial port "A" on the CPU with all CP/M list outputs. To switch all output to the parallel port on a temporary basis you can set a byte in memory at EE33H to a 05H. This can be done with DDT or BASIC with "POKE" instruction. This memory can be calculated for different system sizes by picking up the the bios jump table and can be calculated for different system sizes by picking up the warm boot entry address at memory location 1 and 2, and adding 30H to that address. (30H = 48 decimal)

A second method, which is permanent for the disk that the change was made on and all copies of that disk is to use the system utility DDUMP.COM to modify the byte on the system tracks of the floppy. You will find the bios jump table on track 1 sector 20.

```
DDUMP <CR>              (OPERATOR INPUT)
*                       (PROGRAM RESPONSE)
T 1 S 20 EDIT <CR>      (OPERATOR INPUT)
- EDIT                  (PROGRAM RESPONSE)
33 <CR>                 (OPERATOR INPUT)
0033 00                 (PROGRAM RESPONSE)
05 <CR>                 (OPERATOR INPUT)
0037  00                (PROGRAM RESPONSE) SET TO 01 FOR 6MS  SEEK
WRITE <CR>              (OPERATOR INPUT) WRITES YOUR EDIT TO DISK
^C                      (OPERATOR INPUT) RETURNS TO CP/M

^C
```

A third method is to use a text editor to modify the bios source code module IO.ASM which contains the bios jump table. You will need the Digital Research MAC assembler to do this. It may be purchased from your closest U S MICRO SALES OFFICE.

Obviously if you should want to switch back to serial output, the same byte should be set to a "0".

Note that another complex printer driver option has been supplied in the form of CXLST.ASM and its associated PRINTER.COM. CXLST may require modification to get your printer to work properly. In the command submit file BLKSYS61.SUB, several modules are concatenated by PIP.COM to assemble the system bios. If you plan on changing anything, just tackle the module you need and generate a whole new bios by doing another submit. The distribution version also contains a simple driver called STDLST.ASM. You may want to replace CXLST.ASM with STDLST.ASM and re-assembe the bios. Up to six printer drivers can be resident in the bios at one time useing CXLST.

PRINTER.COM will select the printers by simply typing PRINTER 3 (for example). PRINTER.COM can also change the baud rate that is supplied to the respective printer.

PRINTER.COM has a "TEST" mode (invoked by typeing 'PRINTER T <CR>') which will poll the selected printer port's status port and display the control bits on the screen. BEFORE you try to send data to your printer, run PRINTER.COM in the test mode to see if the status bits are set correctly. This will save an enormous ammount of time in getting things to run.

PRINTER.COM also will send either single characters or a continuous string so that system handshaking can be tested.

Custom PRINTER.COM type programs can be written and renamed DIABLO.COM or MX80.COM or TI810.COM (for example). These can be very simple programs that merely modify one or two cells in system memory. The memory cell 30H bytes past the warm boot entry in the jump table is where the currently logged printer is kept. Bytes at 31H,32H and 33H offset from warm boot are the baud rate bytes for the cpu brg, serial board 1 and 2 respectivly. The system can handle 10 serial ports and 1 Centronics type port with parts available from your USM SALES OFFICE. A0 at offset 30H from warm boot will select channel "A" serial port on the cpu. This is printer # 0. CXLST always initializes to this printer. Printers 1,2,3 and 4 are expected to be on an optional serial expansion board that is available from your U.S. MICRO SALES OFFICE. . Printer 5 is expected to be the parallel port on the CPU. An example of a program that would select printer number 3 and set the baud rate to 1200 baud is as follows:

```
ORG 100H

START:
        MVI   A,03H             ; printer select
        LHLD  1                 ; get warm boot address
        LXI   D,30H             ; offset
        DAD   D                 ;
        MOV   A,M               ; set printer
```

The baud rate port on the CPU is at I.O. port location 0BH. A slight complication arises in that you probably would not wish to change the baud that the system terminal is running at. In this case you would have to read the CPU baud rate switch and ORI the upper 4 data bits on to your new lower 4 bits before re-programming the brg. Look at how things are done in PRINTER.ASM as an example if you have any problems.

9).
Another common problem we get calls on bears mentioning. It is explained in the General Operating proceedures section of your manual how to put the operating system from one diskette to another, but for some reason many customers don't understand this procedure. If you want to transfer the operating system from one disk to another, simply load DSYSGEN and answer (N) and (N) to the first two questions that come on the screen. A table will then appear with a sub-line asking "CODE BYTES FOR SOURCE DISK?". Usually you will need to enter 1A, which signifies 512 byte

single sided. The other common code byte is 9A, which is for 512 byte sectors, but double sided. After determining the type of source disk and drive name, hit a <CR> to "CONTINUE". The next question asked will be for the code byte for the destination disk. After telling dsysgen the type and drive, it will do the transfer. It's really very simply and should take no more than 15 seconds to do. If you find yourself well into the first hour, READ THE MANUAL. There is a step by step example in there. Don't forget that the destination disk must have a suitable format on it. If your not sure on this point, use DFOCO to format the disk.

If you are copying a system on a single sided diskette, to a double sided diskette, DSYSGEN will tell you "the source and destination formats do not agree, do you wish to continue?". Y ou may type yes and the transfer will be complete.

Another item to be noted, all XOR systems are compatible with standard 128 single density, however there is not enough room on the system tracks of the disk to place the system. You must boot up on a Double density diskette in "A" drive. Single density files then may be transferred from "B" to "A" with PIP.

CPU INFO -

Port assignments:

00	Channel "A" status (See status flag below)
01	Channel "A" data
02	Channel "B" status (See status flag below)
03	Channel "B" data
04	Parallel "A" data
05	Parallel "B" data
06	Parallel "C" data
07	Parallel command port
08	Memory management
09	Prom Toggle, 00 = on 01 = off
0A	Boot prom disable
0B	Read/ Baud rate switch Write/ Baud rate generator
0C	CTC chan 1
0D	CTC chan 2
0E	CTC chan 3
0F	CTC CMD

The 8251 can be programmed under software control to do a number of things. The following code can be used to initialize what might be a "normal" mode for the 8251.
(The chip must be initialized or it will do nothing.)

```
MVI A,0AAH      ; Load A
OUT 03          ; Initialize Port B
OUT 01          ; Initialize Port A
MVI A,40H       ; Load A
OUT 03          ; With Internal Reset
OUT 01          ; Write to Both Ports
MVI A,4EH       ; 1 Stop bit, no parity, 8 data bits
OUT 01          ; 16X clock
OUT 03          ;
MVI A,37H       ; RTS = 1, reset errors, enable Rx,
OUT 01          ; DTR = 1, Tx enabled
OUT 03          ;
```

This initialization will set up 8 data bits, one stop bit and no

parity. Your printers and terminals have to be set up to receive the same pattern.

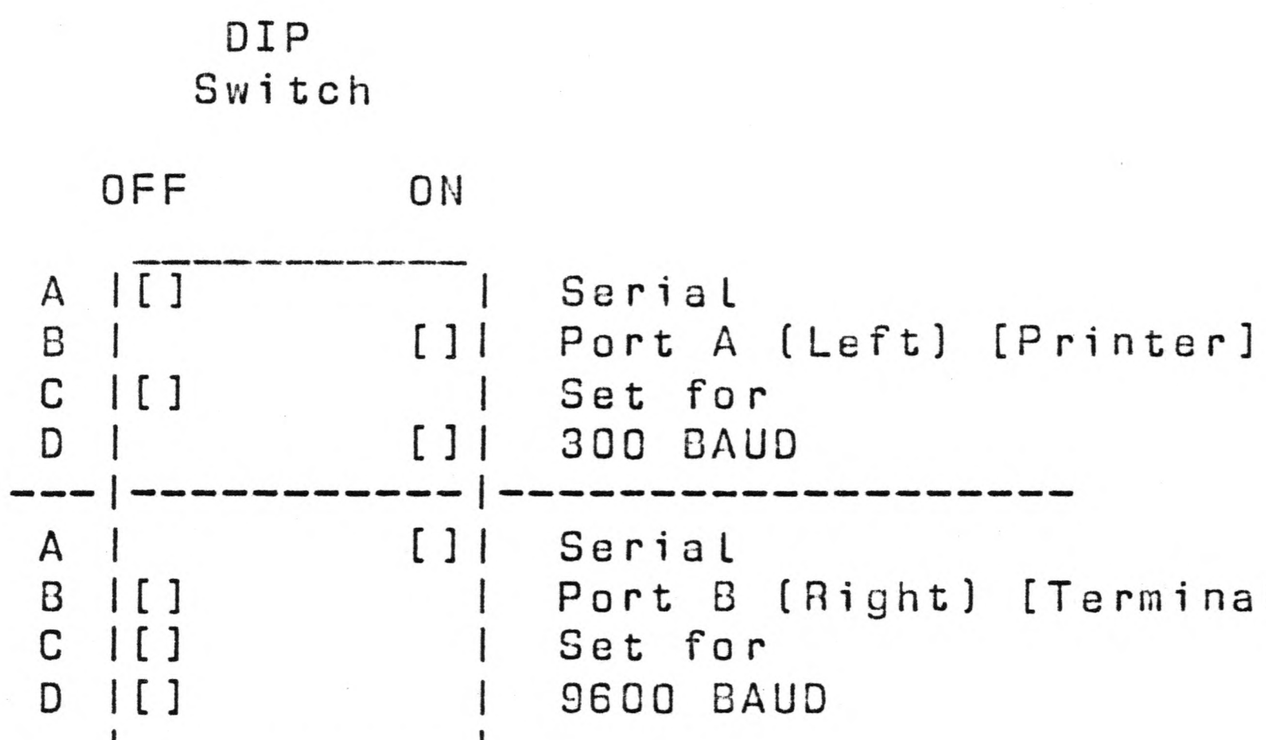
8251 Status Flags (when you input status port, this is what byte will mean):

```
Bit:  07   06   05   04   03   02   01   00
      ---------------------------------
     DSR  SY   FE   OE   PE   TXE RXR TXR <-Output bit (RDY when Hi)
                                   A
                                   |---------Input bit (RDY when Hi)
```

Ports for the Serial IO are: A Status = 1 A Data = 0 (on left)
B Status = 3 B Data = 2 (on right)

The 8 position DIP switch at the lower right hand corner of the board is broken into two 4 bit sections. The upper 4 bits select the IO baud for the left 8251 and the lower 4 bits select the baud for the right. We connect the left 8251 to the "A" paddle card and the right one to the "B" paddle card. The paddle cards are mounted to the rear panel and make strapping adjustments easier. The "A" port is committed in the CP/M bios software to the printer, and the "B" port to the CRT Terminal.

The switches are used in a binary pattern to set the rates as follows:



X = O F F O = O N

Baud	D	C	B	A	
50	0	0	0	0	(00H)
75	0	0	0	X	(01H)
110	0	0	X	0	(02H)
134.5	0	0	X	X	(03H)
150	0	X	0	0	(04H)
300	0	X	0	X	(05H)
600	0	X	X	0	(06H)

Baud	D	C	B	A	
1200	0	X	X	X	(07H)
1800	X	0	0	0	(08H)
2000	X	0	0	X	(09H)
2400	X	0	X	0	(0AH)
3600	X	0	X	X	(0BH)
4800	X	X	0	0	(0CH)
7200	X	X	0	X	(0DH)
9600	X	X	X	0	(0EH)
19200	X	X	X	X	(0FH)

N O T E :
Make sure when using the above chart that the positions we show correspond to the type of switch you have on the board. Some earlier models of switches have the "ON" to the opposite side.

4 Port serial Port assignments

LOW SERIAL PORTS

20	CHANNEL	A	DATA
21	"	A	STATUS
22	"	B	DATA
23	"	B	STATUS
24	"	C	DATA
25	"	C	STATUS
26	"	D	DATA
27	"	D	STATUS

3A BAUD RATE SELECT

HIGH SERIAL PORTS

A0	"	A	DATA
A1	"	A	STATUS
A2	"	B	DATA
A3	"	B	STATUS
A4	"	C	DATA
A5	"	C	STATUS
A6	"	D	DATA
A7	"	D	STATUS

AA BAUD RATE SELECT

PMMI MODEM BASE ADDRESS = C0

SOME TIPS ON HOOKING UP PRINTERS

Almost all serial printers use four basic lines. Our computers "look" like modems in terms of RS-232 specifications. That is because originally terminals attached themselves to modems that in turn talked over phone lines to mainframes. When cheap Microcomputers came on the scene it was logical to make them plug directly into the terminals.

The minimum lines needed to maintain communication are Transmit, Receive, Logic Ground, and Frame Ground. These are on a DB-25 connector on pins 3,2,7 and 1 respectively.

These terms only hold true if you are a modem. DB-25 connector pin assignments should always be referred to as if the modem was the subject. Therefore if pin 3 is "Transmit", if you are a terminal, you should receive on pin 3.

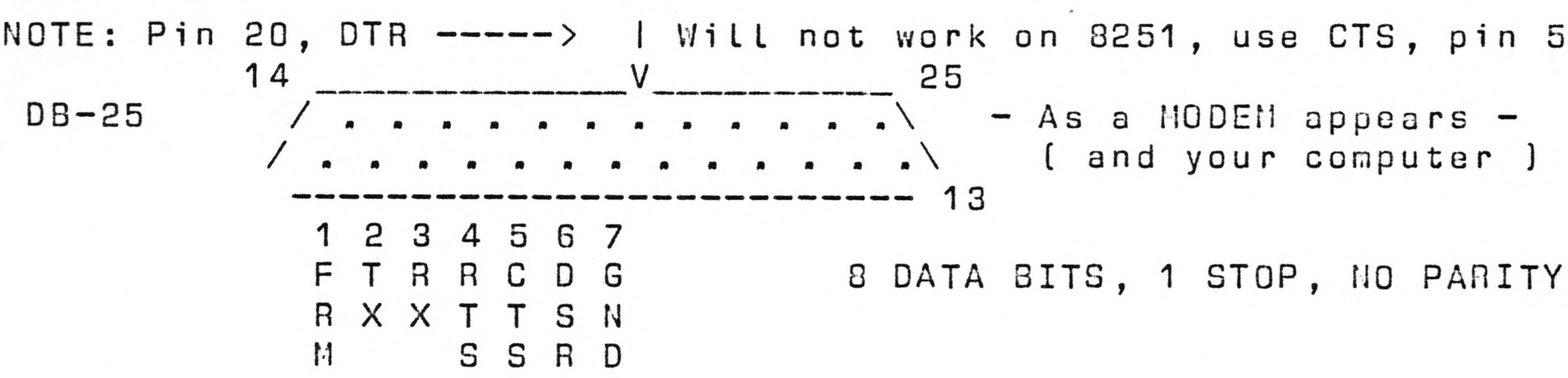
There are other signals on a DB-25 RS-232 serial connector that are standard. These signals were originally intended for modem use and their names reflect these intentions. They are; CTS

(Clear to send), RTS (Request to send), DSR (Data set ready), DTR (Data terminal ready).

These "secondary signals" as they are called are used to inform the terminal user when the computer and transmission equipment can send data.

When attaching a printer, we use the principal signals to convey data in both directions and the secondary signals to "handshake". To handshake means to inform each other when you are prepared to communicate. It's rather like picking up the phone after hearing it ring and saying "Hello". Then the other person identifies himself, and so on. Humans "handshake" in many ways that are not readily apparent. Facing someone and nodding your head to start a conversation is "handshaking".

On our Paddle cards at the back of the computer are places for two resistors. They are called "pull up" resistors and must be installed if the serial port handshaking lines DSR and CTS are not to be used. These resistors can be anything from 1K to 10K. If buffer full handshaking is to be used, the correct line must be located which indicates that status on the printer you are using. The resistor "pulling up" the status line you wish to use must be removed (either can be used), and a jumper soldered between the RS-232 line and place where the resistor was. The other available handshaking line can be used for ON LINE/ OFF LINE status or ??. But for any transmission to take place both serial units must be at the same baud rate and both handshake lines must be acive (high).



PARALLEL CABLE WIRING

This cable is used for Centronics interface printers. It uses a 8255, PA0-7 are used for data transfer, PB0-7 are tied together for data strobe PC6 for ACK from printer.

NOTE: This cable is available from your U S MICRO SALES SALES OFFICE.

```
   26 Pin                                                         36 Pin
---------------                                                ---------------
 CPU CABLE      |                                              |   CENT. CONN.
     (1)   AD0  |----------------       ->        ----------|D0          (2)
     (2)   AD1  |----------------       ->        ----------|D1          (3)   P
     (3)   AD2  |----------------       ->        ----------|D2          (4)   R
 8   (4)   AD3  |----------------       ->        ----------|D3          (5)   I
 2   (5)   AD4  |----------------       ->        ----------|D4          (6)   N
 5   (6)   AD5  |----------------       ->        ----------|D5          (7)   T
 5   (7)   AD6  |----------------       ->        ----------|D6          (8)   E
     (8)   AD7  |----------------       ->        ----------|D7          (9)   R
                |                                           |______
 (9-16)BD0-7    |================       ->        ----------|STROBE      (1)
                |                                           |
   (21)    CD4  |----------------       <-        ----------|ON LINE     (13)
                |                                           |
   (22)    CD5  |----------------       <-        ----------|BUSY        (11)
                |                                           |___
   (23)    CD6  |----------------       <-        ----------|ACK         (10)
                |                                           |
   (26)    GND  |----------------       <->       ----------|SIGNAL      (16)
                |                                 ----------}GROUND      (14)
---------------                                            -----------------
```

CPU 8255 connector pinout looking from front with edge connector at bottom.

```
              2 4 6 8                        26            Serial Conn.
             _____________________________________      _____________
            | . . . . . . . . . . . . .  |              |. . . . . . . |
 |---------| . . . . . . . . . . . . .  |\-----|. . . . . . . |\----|
 |          ------------------------------ |          ------------- |   |
 |          \_____________________________\|          \____________\|   |
 |            1 3 5 7 9                      25                          |
 |                                                                       |
 |                                                                       |
 |                          CPU Component Side                           |
 | ******************************************************************* |
          C U S T U M E R   S E R V I C E   H O T   L I N E          |

                     7 1 4 - 8 9 0 - 5 5 2 5

   *******************************************************************
 |
```